

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
15 March 2001 (15.03.2001)

PCT

(10) International Publication Number
WO 01/17437 A3

(51) International Patent Classification⁷: **A61B 17/02,**
19/00

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(21) International Application Number: **PCT/US00/24372**

(22) International Filing Date:
5 September 2000 (05.09.2000)

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(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
09/390,792 7 September 1999 (07.09.1999) US

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.

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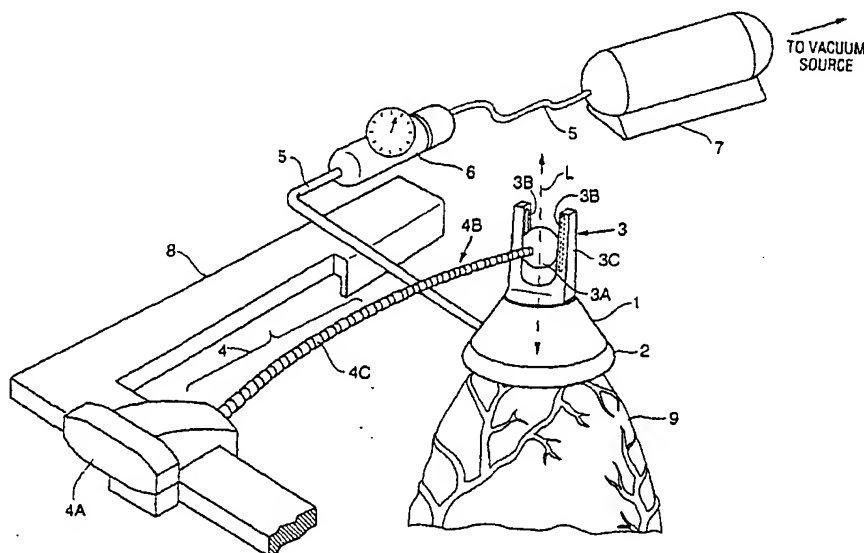
(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

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Published:
— with international search report

[Continued on next page]

(54) Title: **ORGAN MANIPULATOR**



(57) Abstract: An organ manipulator including at least one suction member or adhesive disc mounted to a compliant joint, a flexible locking arm for mounting such suction member or compliant joint, and a method for retracting and suspending an organ in a retracted position using suction (or adhesive force) so that the organ is free to move normally (e.g., to beat or undergo other limited-amplitude motion) in at least the vertical direction during both steps. In preferred embodiments, a suction member exerts suction to retract a beating heart and suspend it in a retracted position during surgery. As the retracted heart beats, the compliant joint allows it to expand and contract freely (and otherwise move naturally) at least in the vertical direction so that hemodynamic function is not compromised.

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(88) Date of publication of the international search report:
27 September 2001

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 00/24372

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A61B17/02 A61B19/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A61B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 919 193 A (ETHICON ENDO-SURGERY, INC.) 2 June 1999 (1999-06-02) the whole document	1,14-17, 19,24,25
Y	---	2-5,7,8, 21-23, 29-36
Y	EP 0 791 330 A (CARDIOTHORACIC SYSTEMS, INC.) 27 August 1997 (1997-08-27) abstract; figures 9A-9E,28A,28B,42-46C,50A-51B,57-63 column 20, line 14 -column 21, line 12 column 30, line 1-20 column 37, line 24 -column 40, line 6 column 41, line 6-53 column 44, line 50 -column 47, line 49 --- -/--	2-5,7,8, 21-23, 29-36

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

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"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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"&" document member of the same patent family

Date of the actual completion of the international search

21 November 2000

Date of mailing of the international search report

20. 03. 2001

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INTERNATIONAL SEARCH REPORT

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 782 746 A (WRIGHT) 21 July 1998 (1998-07-21) cited in the application abstract; figures column 4, line 5-59 column 5, line 5 -column 6, line 16 ---	1,5-8,13
A	WO 97 26828 A (GENTILLI ET AL.) 31 July 1997 (1997-07-31) the whole document ---	1,5,9-12
A	US 5 885 271 A (HAMILTON ET AL.) 23 March 1999 (1999-03-23) abstract; figures ---	1,5,26
A	US 5 927 284 A (BORST ET AL.) 27 July 1999 (1999-07-27) abstract; figures column 8, line 4-16 ---	1,26
A	US 5 799 661 A (BOYD ET AL.) 1 September 1998 (1998-09-01) cited in the application abstract; figures 28-35 column 18, line 14 -column 19, line 48 ---	1
A	WO 98 49944 A (PILLING WECK INCORPORATED ET AL.) 12 November 1998 (1998-11-12) the whole document -----	1,36,37, 40,41, 44,46

INTERNATIONAL SEARCH REPORT

International application No.
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Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.: 50-55
because they relate to subject matter not required to be searched by this Authority, namely:
Rule 39.1(iv) PCT - Method for treatment of the human or animal body by surgery
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-47

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-47

An organ manipulation apparatus having a suction member

2. Claims: 48,49

An organ manipulation apparatus having a bio-absorbable disc with an adhesive surface

3. Claims: 56-67

Locking arm having a flexible state and a rigid state comprising; a cable and ball joints threaded along the cable

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 00/24372

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0919193 A	02-06-1999	US 5984864 A	16-11-1999
		AU 8831898 A	29-04-1999
		CA 2249494 A	07-04-1999
		JP 11192225 A	21-07-1999
		US 6013027 A	11-01-2000
EP 0791330 A	27-08-1997	US 5894843 A	20-04-1999
		AU 1480597 A	28-08-1997
		BR 9701028 A	03-11-1998
		CA 2197614 A	21-08-1997
		JP 10005230 A	13-01-1998
		NO 970753 A	21-08-1997
		US 6050266 A	18-04-2000
		US 6036641 A	14-03-2000
US 5782746 A	21-07-1998	NONE	
WO 9726828 A	31-07-1997	IT T0960033 A	22-04-1996
		AU 1544397 A	20-08-1997
US 5885271 A	23-03-1999	AU 6555498 A	29-09-1998
		WO 9840018 A	17-09-1998
		US 6159201 A	12-12-2000
US 5927284 A	27-07-1999	US 5836311 A	17-11-1998
		AU 7241496 A	09-04-1997
		BR 9610670 A	06-07-1999
		CA 2232580 A	27-03-1997
		CN 1198664 A	11-11-1998
		EP 0939605 A	08-09-1999
		JP 11511366 T	05-10-1999
		NO 981289 A	19-05-1998
		WO 9710753 A	27-03-1997
		US 6015378 A	18-01-2000
US 5799661 A	01-09-1998	US 5735290 A	07-04-1998
		US 5452733 A	26-09-1995
		AU 5962196 A	30-12-1996
		CA 2222326 A	19-12-1996
		EP 0837712 A	29-04-1998
		WO 9640354 A	19-12-1996
		US 6010531 A	04-01-2000
		US 5766151 A	16-06-1998
		US 6029671 A	29-02-2000
		US 6027476 A	22-02-2000
		AU 688303 B	12-03-1998
		AU 6024594 A	14-09-1994
		CA 2154354 A	01-09-1994
		EP 0684781 A	06-12-1995
		JP 8511694 T	10-12-1996
		WO 9418881 A	01-09-1994
		US 5571215 A	05-11-1996
		US 5425705 A	20-06-1995
		US 5569274 A	29-10-1996
		US 5613937 A	25-03-1997
		US 5536251 A	16-07-1996
		US 5797960 A	25-08-1998
		US 5713951 A	03-02-1998

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 00/24372

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5799661 A		US 5728151 A	17-03-1998
		US 5718725 A	17-02-1998
		US 5682906 A	04-11-1997
		US 5961481 A	05-10-1999
		US 6079414 A	27-06-2000
		US 5814097 A	29-09-1998
		US 5855614 A	05-01-1999
		US 5823956 A	20-10-1998
		US 5829447 A	03-11-1998
		US 6125852 A	03-10-2000
		US 5855210 A	05-01-1999
		US 5814016 A	29-09-1998
		US 5980455 A	09-11-1999
		US 6161543 A	19-12-2000
		US 5972030 A	26-10-1999
		US 5924424 A	20-07-1999

WO 9849944 A	12-11-1998	AU 7175398 A	27-11-1998
		US 5899425 A	04-05-1999
